PROJECT CONCEPT REPORT

THIN LIFT OVERLAY

Project No.
SNH-6-081(058)218

PCN
14769

US 81 from RP 218.580 to RP 228.331

Prepared by

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
BISMARCK, NORTH DAKOTA

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GRAND FORKS DISTRICT ENGINEER
(DE Name)

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March 2003

PROJECT CONCEPT REPORT
PREVENTIVE MAINTENANCE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Date: 12-15-01

This project concept report is submitted for your consideration and approval:

PURPOSE AND NEED

Project Description:

Project No.: SNH-6-081(058)218 PCN No.: 14769

County: Pembina

Location and Length (Gross and Net): US 81 from RP 281.580 East of the Jct. of ND 5 to RP 228.331 West of the Jct. with I-29. The project is 9.616 miles.

Highway Functional Classification:

☒ NHS	☐ NON-NHS	☒ Rural	☐ Urban
☐ Interstate	☐ Interregional		
☒ State Corridor	☐ District Corridor	☐ District Collector	

Existing Conditions:

Driving Surface Type: Asphalt Width: 24 ft

Shoulder Surface Type: Asphalt Width: 1.5 ft

Most Recent Improvement Type and Year: 1193, Chip Seal

Pavement Age: 48 Effective Pavement Age: 24

Foreslope Ratio: 4:1

Traffic Data:

Current ADT: 1365 Percent Trucks: 11% ESAL's: 110

Pavement Conditions:

	Average Score		
Distress Score:	83	Fair	Rating (Excellent, Good, Fair, Poor)
Ride Score:	3.31		
IRI (in/mile):	92.57	Fair	PRPI Value (Excellent, Good, Fair, Poor)
Rut (in)	0.12		

Average Pavement Condition Rating Deduct Values

Flexible: Asphalt or Composite (AOCRC or AOPJC)		Concrete: (Jointed or Continuous Reinforced)	
Alligator Cracking	2	"D" Cracking	
Bleeding	0	Corner Breaks	
Longitudinal Cracking	3	Longitudinal Joint Spalling	
Transverse Cracking	7	Longitudinal Cracking	
Block Cracking	0	Transverse Cracking	
Raveling/Weathering	0	Transverse Joint Spalling	
Bituminous Patching	4	Faulting	
Rutting	0	Broken Slabs	
		Bituminous Patching	
		Concrete Patch Det.	
		Blow-Up Repairs	

5 year ave. yearly Maintenance Cost ($/mi): 859

ALTERNATIVES

Proposed Improvements:

Flexible: Asphalt or Composite (AOCRC or AOPJC)

- ☐ Seal Coat
- ☐ Micro Surfacing
- ☒ HBP – Thin Lift Overlay (1 ½") and Patching
- ☐ Milling
- ☐ Other _____***

Concrete: (Jointed or Continuous Reinforced

- ☐ Minor CPR
- ☐ $ Spalls
- ☐ $ Blow-Ups
- ☐ $ Broken Panels
- ☐ $ Punchouts
- ☐ $ Joint & Crack Sealing
- ☐ $ Finger Joints (repair & replace)
- ☐ $ Underdrain (repair & cleaning)
- ☐ $ Grinding
- ☐ $ Other _____**

*** *If the proposed improvement is OTHER, discuss here, or include as an attachment.*

Narrative of Proposed Improvements:

A brief summary of the proposed improvements (type of work being done) and justification of why the improvements should be completed.

The proposed improvements are to overlay the existing roadway with 1 ½" of Hot Bituminous Pavement Class 27. No safety improvements will be done with this project.

This proposed improvement will improve the ride scores, maintain the roadway at a serviceable level, and delay the need for reconstruction.

Proposed Cross Sectional Elements:

Surfaced Roadway Width: 24 ft
Shoulder Width: 1.5 ft
Foreslope Ratio(H:V): 4:1 ft:ft

☒ Existing and Proposed Typical Sections are attached.

Existing and Proposed Typical Sections should be included for projects that change the roadway typical section including Micro Surfacing, HBP Thin Lift Overlay, HBP Patching, and Milling projects.

Proposed Special Design Elements:

Design Exception Proposed for shoulder width
(per Preventive Maintenance Guidelines): Yes __X___ No _____

If yes, discuss the design exception and include as an attachment.

Estimated Cost: $ 569,321.14

☒ Detailed Cost Estimate Attached

Programmed Cost: $ 982,000.00

Use the State Transportation Improvement Plan to find Programmed Costs.

Cost Effectiveness:

Estimated Design Life of Proposed Improvement: 7 yrs
Estimated Cost/Mile: $ 59,205.56

☒ The estimated service life and estimated cost per mile are within the range determined to be cost effective for the proposed improvements as identified in Section II-05 and Appendix II-05 G of the Design Manual.

☐ A Cost Effectiveness Analysis attached.

For work activities not identified in the Preventive Maintenance Cost Effectiveness Guidelines, the cost effectiveness shall be determined by comparing the Life Cycle Costs (Net Present Worth) for the proposed work versus reconstruction or other appropriate work.

IMPACTS

Wetlands: Yes _____ No _X_
Cultural: Yes _____ No _X_

Discussion:

Generally this work will be conducted only on top of the existing roadway so there will be no impacts to wetlands or cultural resources. If there is an activity proposed that may have an impact, it should be discussed in "Proposed Improvements" and the impacts discussed in this section.

DECISIONS

1) Should this project continue to be advanced?

Yes __X__ No _____

2) Do you concur in the project concepts proposed?

Yes __X__ No _____

Comments: _____

_____

Approved:

Signed _____
Name, P.E., District Engineer

_____
Date

Format Revised January, 2002

Design Exception
SNH-8-081(058)218
RP 218.580 to RP 228.331

The proposed preventive maintenance project will provide for a 1.5' shoulder and 2.5' sloughs at 4:1 slope. The existing roadway has a 1.5' shoulder at this time. Therefore, the roadway will not be degraded by applying a 1 ½" overlay. The 3R standards for this rural two-lane highway require 3' shoulders for highways with an ADT of 751 or over. To meet full 3R or new design standards, the roadway would have to be widened or reconstructed. Therefore, a design exception is required. The existing inslopes have a slope ratio of 4:1. Therefore, the inslopes cannot be steepened. The cost to bring this section up to 3R standards shoulder with is estimated to be $570,138. Mitigation for the narrow shoulder in the form of signing, 6" edge lines, or post delineators have been considered and will not be implemented.

As there have been no major crash problems on this section of highway, and the proposed shoulder widths are compatible with adjacent sections of roadway, a design exception is requested for the proposed shoulder width. Obtaining the full shoulder width would be more economical with a future 3R or reconstruction project at which time the pavement requires more extensive rehabilitation or replacement.

Recommend for Approval:

Signed 1-07-02
Francis Ziegler- Director, Project Development Date

Approval

Signed 1-07-02
Grant Levi-Deputy Director for Engineering Date

Approval Yes X No

Signed 1-07-02
FHWA Date

Design Exceptions will be submitted to FHWA for approval on projects with full involvement.

Detailed Cost Estimate

Item No.	Spec No.	Code No.	Description	Units	Estimated Quantity	Unit Cost	Total Cost
1	103	0100	Contract Bond	LSUM	1	$7,200.00	$7,200.00
2	401	0150	SS1H or CSS1H or MS1 Emulsified Asphalt	GAL	9,153	0.91	8,329.23
3	408	0196	Hot Bituminous Pavement 408 Special	TON	16,121	18.00	290,178.00
4	408	0445	PG 58-28 Asphalt Cement	TON	1,074	148.57	159,564.18
5	410	0105	Milling Bituminous Pavement	SY	533	1.00	533.00
6	702	0100	Mobilization	LSUM	1	32,923.37	32,923.37
7	704	0100	Flagging	MHR	140	14.28	1,999.20
8	704	1000	Traffic Control Signs	UNIT	1,523	3.18	4,843.14
9	704	1185	Pilot Car	HR	70	19.49	1,364.30
10	706	0300	Field Laboratory-Type C	EA	1	3,481.00	3,481.00
11	762	0405	Short Term 4” Broken Line – Pnt, Tape or Rsd Mk	LF	12,734	0.17	2,164.78
12	762	0410	Short Term 4” Line NPZ – Pnt, Tape or Ps Mrk	LF	2,930	0.10	293.00
13	762	1104	Pvmt Mk Painted 4 in. Line	LF	117,287	0.04	4,691.48
						Sub Total	$517,564.68
						10% Eng. Cost	$51,759.46
						Grand Total	**$569,321.14**